

INTERMOUNTAIN POWER SERVICE CORPORATION

b1968
~~b1969~~

File: 01.03.01
IGS91-3

Faxed 3/30 to BEB
Sent Express 3/30 AMR

March 30, 1992

Mr. Bruce E. Blowey
Engineer of Generation - External
LADWP
P.O. Box 111, Room 1255C
Los Angeles, CA 90051-0100

Dear Mr. Blowey:

Request for Approval to Install Flame Stabilizers on Unit 1

Please approve us to install flame stabilizers on Unit 1 during the upcoming outage. As per your letter of March 10, 1992, we have completed the following tasks:

1. We have inspected the flame stabilizers on Unit 2 along with Larry Jones from your staff and Raffi Krikorian from the Mechanical Engineering Section. We found the condition of the stabilizers to be like new. We did not find any cracking or deformation of the stabilizers. There was some ash accumulation around the roots of the blades on some of the burners that had been out of service, but it was not enough to hinder air flow significantly.

There was evidence that the stabilizers are performing as intended. We did not find any new indication of nozzle or back plate overheating. All of the burner nozzles were round and no nozzle droop was noticed. We did not find any accumulation of ash in any of the burner air sleeves which indicates that the flue gas recirculation has been reduced. There were still some eyebrows in the furnace, particularly over Burner Row H that was out of service for a long time, but the amount seemed far less than previous experience. We could not find any negative effects from the inspection that could be attributed to the stabilizers.

2. The before and after test data and analyses related to the installation of the stabilizers was previously given to you during the meeting on February 19, 1992. We have attached it to this letter for your reference.

Mr. Bruce E. Blowey
Page 2
March 30, 1992

3. We have performed NOx testing on Unit 2 as per your request. We determined that the best conditions for testing NOx to achieve comparable results is with all eight pulverizers in-service. This eliminates the variability of cooling air requirements to out-of-service burners which we know has a considerable effect on NOx levels. Some variability will always exist because of different coal quality and ambient conditions.

We did a similar test on Unit 2 on June 6, 1989, which can be used as a comparison.

NOx Lbs/Mbtu
June 6, 1989

0.42

NOx Lbs/Mbtu
March 24, 1992

0.40

The above NOx numbers are the mean values from the testing period. The June 6, 1989, test was the only other period for which we had test data with all eight pulverizers in-service.

It is also interesting to compare the historical operating data for average NOx levels for the period of January 1 to March 15, on both Units as summarized below:

NOx Lbs/Mbtu
Unit 1

1988	0.39
1989	0.41
1990	0.38
1991	0.36
1992	0.38

NOx Lbs/Mbtu
Unit 2

0.39
0.39
0.34
0.34
0.37

As you can see, the NOx levels for 1992 are about the same as the average for the four preceding years and it is not uncommon to have small incremental changes from year to year.

4. Baseline NOx level testing will be done on Unit 1 during the week of March 30, 1992. Further testing will be done after the outage for comparison.

Mr. Bruce E. Blowey
Page 3
March 30, 1992

Once again, please approve our request to install stabilizers on Unit 1's burners during the upcoming outage. If you require any additional information or if you have any questions, please contact Jerry Hintze at (801) 864-4414, Extension 6460.

Sincerely,



S. Gale Chapman
President & Chief Operations Officer

JKH:dh

Attachments

cc: Doug Fowler (PD&C)
Byron Fujikawa

IP7_000816

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

NOTES ON TEST CONDITIONS:

- 1 The second test condition (with flame stabilizers) is tested with less cooling air flow levels. This is due to the fact that windbox duct pressures have increased by 1.3"wc due to shrouding of the outer air register. There is no compartmentalized air flow metering to set test conditions the same, so the same damper positions were used.
- 2 Due to physical problems with the burner assemblies (warpage, poor vane conditions, etc.), register setup had to be compromised to prove flame conditions for the scanners. This condition adversely effects cooling air flow requirements to individual burners.

BURNER FRONT TEMPERATURES (F average)

Burner Number

		1	2	3	4	5	6	Maximum	Average
Pulv E	W/O FS	1266	1318	1261	1164	1237	1234	1318	1247
	W/ FS	1257	1309	1216	1256	1219	1086	1309	1224
Pulv A	W/O FS	1104	1233	1035	1142	1205	1120	1233	1140
	W/ FS	1089	1197	1274	1048	1060	1080	1274	1125
Pulv F	W/O FS	1102	1097	1221	1241	1157	1082	1241	1150
	W/ FS	1153	1112	1139	1197	1102	1088	1197	1132
Pulv B	W/O FS	1070	1196	1181	1164	1132	1060	1196	1134
	W/ FS	1037	1071	1127	1100	1045	995	1127	1063
Summary- Frnt Wall								69	71
Dev								20	32
Pulv D	W/O FS	1115	1185	1208	1250	1248	1174	1250	1197
	W/ FS	1051	1111	1119	1170	1159	1090	1170	1117
Pulv H	W/O FS	1037	1066	1152	1291	1141	1066	1291	1126
	W/ FS	983	1146	1049	1226	1155	1146	1226	1118
Pulv C	W/O FS	1009	1150	1151	1144	1075	1122	1151	1109
	W/ FS	964	1053	1056	1097	1155	1082	1155	1068
Pulv G	W/O FS	1024	1091	1188	1199	1131	1062	-4	41
	W/ FS	936	940	1010	1032	1007	993	1199	1116
Summary- Rear Wall								1032	986
Dev								167	130
Dev								77	65
SUMMARY								49	48
AVE DEV									

IP7_000817

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	5/6/91	2/13/92
Load (MWg)	838.6	839.8
7 mill operation, Pulv ?? out of service	2E	2E
Total Air Flow (%)	73.4	74.4
Excess Air (%)	3.06	3.08
Total Fuel Flow (TPH)	321.7	327.1
O/S Windbox Damper Position:	19	19

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1266	1318	1261	1164	1237	1234
W/ Stabilizers	1257	1309	1216	1256	1219	1086

Overall Temp Improvement

Maximum	Average
1318	1247
1309	1224
9	23

IP7_000818

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	9/2/91	2/18/92
Load (MWg)	839.1	839.9
7 mill operation, Pulv ?? out of service	2A	2A
Total Air Flow (%)	74.1	73.4
Excess Air (%)	3.06	2.95
Total Fuel Flow (TPH)	318	317.5
O/S Windbox Damper Position:	25	25

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1104	1233	1035	1142	1205	1120
W/ Stabilizers	1089	1197	1274	1048	1060	1080

Overall Temp Improvement

Maximum	Average
1233	1140
1274	1125
-41	15

IP7_000819

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	7/16/91	2/12/91
Load (MWg)	839.3	840.1
7 mill operation, Pulv ?? out of service	2F	2F
Total Air Flow (%)	74.8	73.8
Excess Air (%)	2.93	2.98
Total Fuel Flow (TPH)	330.3	325.2
O/S Windbox Damper Position:	28	28

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1102	1097	1221	1241	1157	1082
W/ Stabilizers	1153	1112	1139	1197	1102	1088

Overall Temp Improvement

Maximum	Average
1241	1150
1197	1132
44	18

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	8/27/91	2/7/92
Load (MWg)	841	841.1
7 mill operation, Pulv ?? out of service	2B	2B
Total Air Flow (%)	75.7	76.6
Excess Air (%)	3.00	3.15
Total Fuel Flow (TPH)	330.9	322.7
O/S Windbox Damper Position:	23	23

BURNER FRONT TEMPERATURES (F average)

	Burner Number					
H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1070	1196	1181	1164	1132	1060
W/ Stabilizers	1037	1071	1127	1100	1045	995

Maximum	Average
1196	1134
1127	1063
69	71

Overall Temp Improvement

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	9/3/91	2/5/92
Load (MWg)	839.8	839.5
7 mill operation, Pulv ?? out of service	2D	2D
Total Air Flow (%)	73.7	74.5
Excess Air (%)	3.03	2.98
Total Fuel Flow (TPH)	319	320
O/S Windbox Damper Position:	40	40

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1115	1185	1208	1250	1248	1174
W/ Stabilizers	1051	1111	1119	1170	1159	1090

Overall Temp Improvement

Maximum	Average
1250	1197
1170	1117
80	80

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

1/24/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	10/16/91	12/10/91
Load (MWg)	842.2	840.6
7 mill operation, Pulv ?? out of service	2H	2H
Total Air Flow (%)	74.2	74.7
Excess Air (%)	3.42	3
Total Fuel Flow (TPH)	329.7	326.2
O/S Windbox Damper Position:	51	51

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1037	1066	1152	1291	1141	1066
W/ Stabilizers	955	1128	1079	1194	1140	1128

Overall Temp Improvement

Maximum	Average
1291	1126
1194	1104
97	22

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	4/15/91	2/9/92
Load (MWg)	841	840.1
7 mill operation, Pulv ?? out of service	2C	2C
Total Air Flow (%)	74.4	75.1
Excess Air (%)	3.13	2.98
Total Fuel Flow (TPH)	320.7	325.5
O/S Windbox Damper Position:	53	53

BURNER FRONT TEMPERATURES (F average)

H Burners O/S

Burner Number

	1	2	3	4	5	6
W/O Stabilizers	1009	1150	1151	1144	1075	1122
W/ Stabilizers	964	1053	1056	1097	1155	1082

Maximum	Average
1151	1109
1155	1068
-4	41

Overall Temp Improvement

IP7_000824

Burner Front Temperature Analysis (Based upon typical operating conditions)

IGS UNIT 2

2/14/92

Case 1: Before Flame Stabilizers

Case 2: After Flame Stabilizers

Average Operating Conditions:

Date:	6/19/91	2/6/92
Load (MWg)	840.8	839.2
7 mill operation, Pulv ?? out of service	2G	2G
Total Air Flow (%)	75.4	75.4
Excess Air (%)	3.10	3.04
Total Fuel Flow (TPH)	322.2	323.2
O/S Windbox Damper Position:	33	33

BURNER FRONT TEMPERATURES (F average)

Burner Number

H Burners O/S	1	2	3	4	5	6
W/O Stabilizers	1024	1091	1188	1199	1131	1062
W/ Stabilizers	936	940	1010	1032	1007	993

Overall Temp Improvement

Maximum	Average
1199	1116
1032	986
167	130

IP7_000825

BASIC PLATE

pull handle (T-bar)

ID	PRESENT VEL	% DEV	CORR OPENING	NEW 1 DELTA	NEW 1 OPENING	NEW VEL
FE6	2974	5.67	.05	5.00	.27	4.73
FE5	3080	9.44	.09	5.00	.43	4.57
FE4	3004	6.75	.06	5.00	.32	4.68
FE3	2618	-6.99	-.08	5.00	-.38	5.38
FE2	2688	-4.50	-.05	5.00	-.24	5.24
FE1	2594	-7.83	-.08	5.00	-.42	5.42
FA6	2903	3.15	.03	5.00	.15	4.85
FA5	3209	14.04	.12	5.00	.62	4.38
FA4	3169	12.62	.11	5.00	.56	4.44
FA3	2614	-7.13	-.08	5.00	-.38	5.38
FA2	2271	<u>-19.32</u>	-.24	5.00	-1.20	6.20
FA1	2623	-6.78	-.07	5.00	-.36	5.36
FF6	2843	1.04	.01	5.00	<u>-.05</u>	<u>4.95</u>
FF5	2973	5.64	.05	5.00	.27	4.73
FF4	2723	-3.24	-.03	5.00	-.17	5.17
FF3	2720	-3.33	-.03	5.00	-.17	5.17
FF2	2551	-9.34	-.10	5.00	-.51	5.51
FF1	2498	-11.25	-.13	5.00	-.63	5.63
FB6	2649	-5.88	-.06	5.00	-.31	5.31
FB5	2876	2.19	.02	5.00	.11	4.89
FB4	2807	-.25	.00	5.00	<u>-.01</u>	<u>5.01</u>
FB3	2166	<u>-23.04</u>	-.30	5.00	-1.50	6.50
FB2	2196	-21.96	-.28	5.00	-1.41	6.41
FB1	2265	-19.52	-.24	5.00	-1.21	6.21
RD1	3184	13.15	.12	5.00	.58	4.42
RD2	3127	11.13	.10	5.00	.50	4.50
RD3	2884	2.48	.02	5.00	.12	4.88
RD4	3065	8.90	.08	5.00	.41	4.59
RD5	2688	-4.47	-.05	5.00	-.23	5.23
RD6	2804	-.34	.00	5.00	<u>-.02</u>	<u>5.02</u>
RH1	3139	11.55	.10	5.00	.52	4.48
RH2	3104	10.30	.09	5.00	.47	4.53
RH3	2832	.63	.01	5.00	<u>-.03</u>	<u>4.97</u>
RH4	3032	7.73	.07	5.00	.36	4.64
RH5	2731	-2.97	-.03	5.00	-.15	5.15
RH6	2571	-8.62	-.09	5.00	-.47	5.47
RC1	3241	15.15	.13	5.00	.66	4.34
RC2	3440	<u>22.24</u>	.18	5.00	.91	4.09
RC3	3205	13.89	.12	5.00	.61	4.39
RC4	3056	8.58	.08	5.00	.40	4.60
RC5	1566	<u>-44.34</u>	-.80	5.00	-3.98	8.98
RC6	3033	7.79	.07	5.00	.36	4.64
RG1	3125	11.05	.10	5.00	.50	4.50
RG2	3084	9.59	.09	5.00	.44	4.56
RG3	3449	<u>22.57</u>	.18	5.00	.92	4.08
RG4	2634	<u>-6.40</u>	-.07	5.00	-.34	5.34
RG5	2612	-7.19	-.08	5.00	-.39	5.39
RG6	2460	-12.60	-.14	5.00	-.72	5.72
	1.566		-79.66			2814
	2.814		18.41			.00
						.00
						2814

INNER AIR SLEEVE
BASELINE CONDITIONS.

IP7_000826

~~RECEIVED~~ BACKPLATE 11/28/81

ID	PRESENT VEL	% DEV	CORR PRESENT OPENING	PRESENT AREA	REVISED AREA OPENING	NEW 1	NEW BAND	NEW VEL
FE6	3221	8.64	.08	4.73	297.04	273.42	.435	-.38 2965
FE5	3151	6.29	.06	4.57	287.00	270.01	4.30	-.27 2965
FE4	3165	6.76	.06	4.68	293.90	275.30	4.38	-.30 2965
FE3	2862	-3.48	-.04	5.38	337.86	350.05	5.57	.19 2965
FE2	2924	-1.39	-.01	5.24	329.07	333.70	5.31	.07 2965
FE1	2771	-6.55	-.07	5.42	340.38	364.24	5.80	.38 2965
FA6	3090	4.21	.04	4.85	304.58	292.28	4.65	-.20 2965
FA5	3333	12.41	.11	4.38	275.06	244.69	3.90	-.48 2965
FA4	3258	9.90	.09	4.44	278.83	253.71	4.04	-.40 2965
FA3	3040	2.53	.02	5.38	337.86	329.53	5.25	-.13 2965
FA2	2929	-1.20	-.01	6.20	389.36	394.08	6.28	.08 2965
FA1	2930	-1.16	-.01	5.36	336.61	340.55	5.42	.06 2965
FF6	3191	7.62	.07	4.95	310.86	288.85	4.60	-.35 2965
FF5	3130	5.59	.05	4.73	297.04	281.32	4.48	-.25 2965
FF4	2940	-.85	-.01	5.17	324.68	327.47	5.21	.04 2965
FF3	3097	4.46	.04	5.17	324.68	310.80	4.95	-.22 2965
FF2	2893	-2.43	-.02	5.51	346.03	354.63	5.65	.14 2965
FF1	2878	-2.92	-.03	5.63	353.56	364.18	5.80	.17 2965
FB6	2769	-6.60	-.07	5.31	333.47	357.03	5.69	.38 2965
FB5	2931	-1.14	-.01	4.89	307.09	310.62	4.95	.06 2965
FB4	2948	-.56	-.01	5.01	314.63	316.39	5.04	.03 2965
FB3	2669	-9.99	-.11	6.50	408.20	453.52	7.22	.72 2965
FB2	2624	11.50	-.13	6.41	402.55	454.85	7.24	.83 2965
FB1	2590	12.64	-.14	6.21	389.99	446.40	7.11	.90 2965
RD1	3076	3.76	.04	4.42	277.58	267.52	4.26	-.16 2965
RD2	2998	1.11	.01	4.50	282.60	279.51	4.45	-.05 2965
RD3	2929	-1.20	-.01	4.88	306.46	310.18	4.94	.06 2965
RD4	2843	-4.11	-.04	4.59	288.25	300.61	4.79	.20 2965
RD5	2702	-8.85	-.10	5.23	328.44	360.32	5.74	.51 2965
RD6	2943	-.73	-.01	5.02	315.26	317.56	5.06	.04 2965
RH1	3161	6.63	.06	4.48	281.34	263.85	4.20	-.28 2965
RH2	3105	4.73	.05	4.53	284.48	271.62	4.33	-.20 2965
RH3	2829	-4.59	-.05	4.97	312.12	327.13	5.21	.24 2965
RH4	3013	1.61	.02	4.64	291.39	286.78	4.57	-.07 2965
RH5	2788	-5.98	-.06	5.15	323.42	343.98	5.48	.33 2965
RH6	2768	-6.65	-.07	5.47	343.52	368.00	5.86	.39 2965
RC1	3178	7.20	.07	4.34	272.55	254.24	4.05	-.29 2965
RC2	3086	4.10	.04	4.09	256.85	246.73	3.93	-.16 2965
RC3	3137	5.82	.05	4.39	275.69	260.53	4.15	-.24 2965
RC4	2877	-2.97	-.03	4.60	288.88	297.71	4.74	.14 2965
RC5	2914	-1.72	-.02	8.98	563.94	573.80	9.14	.16 2965
RC6	2748	-7.31	-.08	4.64	291.39	314.37	5.01	.37 2965
RG1	3167	6.81	.06	4.50	282.60	264.59	4.21	-.29 2965
RG2	3125	5.41	.05	4.56	286.37	271.68	4.33	-.23 2965
RG3	3182	7.31	.07	4.08	256.22	238.77	3.80	-.28 2965
RG4	2822	-4.80	-.05	5.34	335.35	352.28	5.61	.27 2965
RG5	2842	-4.15	-.04	5.39	338.49	353.14	5.62	.23 2965
RG6	2744	-7.46	-.08	5.72	359.22	388.17	6.18	.46 2965
	2,590		-14.47					2965
	2,965		11.04					.00
								.00
								2965

INNER AIR SLEEVE
AFTER FIRST ITERATION

IP7_000827

Shrouds

ID	PRESENT VEL	% DEV	CORR PRESENT	NEW 1 BAND	NEW 1 WIDTH	NEW VEL
FE6	3155	.71	.01	5.90	.04	5.86 3133
FES	3162	.92	.01	5.90	.05	5.85 3133
FE4	3134	.01	.00	5.90	.00	5.90 3133
FE3	2891	-7.74	-.08	5.90	-.49	6.39 3133
FE2	3036	-3.11	-.03	5.90	-.19	6.09 3133
FE1	3370	7.55	.07	5.90	.41	5.49 3133
FA6	3240	3.42	.03	5.90	.20	5.70 3133
FA5	3236	3.27	.03	5.90	.19	5.71 3133
FA4	3274	4.50	.04	5.90	.25	5.65 3133
FA3	3204	2.25	.02	5.90	.13	5.77 3133
FA2	3187	1.73	.02	5.90	.10	5.80 3133
FA1	3177	1.39	.01	5.90	.08	5.82 3133
FF6	2979	-4.92	-.05	5.90	-.30	6.20 3133
FF5	3080	-1.70	-.02	5.90	-.10	6.00 3133
FF4	3013	-3.82	-.04	5.90	-.23	6.13 3133
FF3	2866	-8.53	-.09	5.90	-.55	6.45 3133
FF2	2790	-10.94	-.12	5.90	-.72	6.62 3133
FF1	3071	-1.99	-.02	5.90	-.12	6.02 3133
FB6	2775	-11.43	-.13	5.90	-.76	6.66 3133
FB5	2917	-6.91	-.07	5.90	-.44	6.34 3133
FB4	2841	-9.31	-.10	5.90	-.61	6.51 3133
FB3	2919	-6.85	-.07	5.90	-.43	6.33 3133
FB2	2727	-12.97	-.15	5.90	-.88	6.78 3133
FB1	2988	-4.62	-.05	5.90	-.29	6.19 3133
RD1	2900	-7.44	-.08	5.90	-.47	6.37 3133
RD2	2900	-7.43	-.08	5.90	-.47	6.37 3133
RD3	2844	-9.22	-.10	5.90	-.60	6.50 3133
RD4	3177	1.39	.01	5.90	.08	5.82 3133
RDS	3086	-1.51	-.02	5.90	-.09	5.99 3133
RD6	2962	-5.46	-.06	5.90	-.34	6.24 3133
RH1	3355	7.07	.07	5.90	.39	5.51 3133
RH2	3221	2.81	.03	5.90	.16	5.74 3133
RH3	3641	16.20	.14	5.90	.82	5.08 3133
RH4	3736	19.23	.16	5.90	.95	4.95 3133
RH5	3836	22.45	.18	5.90	1.08	4.82 3133
RH6	3530	12.66	.11	5.90	.66	5.24 3133
RC1	3166	1.06	.01	5.90	.06	5.84 3133
RC2	3143	.32	.00	5.90	.02	5.88 3133
RC3	3198	2.07	.02	5.90	.12	5.78 3133
RC4	3161	.88	.01	5.90	.05	5.85 3133
RC5	3093	-1.29	-.01	5.90	-.08	5.98 3133
RC6	3271	4.38	.04	5.90	.25	5.65 3133
RG1	2886	-7.90	-.09	5.90	-.51	6.41 3133
RG2	3208	2.40	.02	5.90	.14	5.76 3133
RG3	3312	5.70	.05	5.90	.32	5.58 3133
RG4	3229	3.07	.03	5.90	.18	5.72 3133
RG5	3276	4.56	.04	5.90	.26	5.64 3133
RG6	3230	3.08	.03	5.90	.18	5.72 3133
	2.727		-14.91			3133
	3.133		18.33			.00
						.00
						3133

OUTER AIR REGISTER
BASELINE CONDITIONS

OUTER REGISTERS NEW SURROGATE SCATTER PLOTS

2nd T

11/20

ID	PRESENT VEL	% DEV	CORR PRESENT WIDTH	CURRENT AREA	REVISED AREA	NEW 1 BAND	NEW 1 WIDTH	NEW VEL
FE6	3329	1.18	.01	5.86	644.60	637.08	-.07	5.79
FE5	3216	-2.26	-.02	5.85	643.50	658.40	.14	5.99
FE4	3285	-.17	.00	5.90	649.00	650.11	.01	5.91
FE3	3252	-1.15	-.01	6.39	702.90	711.11	.07	6.46
FE2	3297	.21	.00	6.09	669.90	668.51	-.01	6.08
FE1	3434	4.36	.04	5.49	603.90	578.66	-.23	5.26
FA6	3547	7.79	.07	5.70	627.00	581.69	-.41	5.29
FA5	3332	1.28	.01	5.71	628.10	620.17	-.07	5.64
FA4	3151	-4.25	-.04	5.65	621.50	649.07	.25	5.90
FA3	3313	.68	.01	5.77	634.70	630.41	-.04	5.73
FA2	3194	-2.94	-.03	5.80	638.00	657.30	.18	5.98
FA1	3455	5.01	.05	5.82	640.20	609.66	-.28	5.54
FF6	3041	-7.58	-.08	6.20	682.00	737.93	.51	6.71
FF5	3154	-4.14	-.04	6.00	660.00	688.48	.26	6.26
FF4	3153	-4.18	-.04	6.13	674.30	703.73	.27	6.40
FF3	3396	3.19	.03	6.45	709.50	687.54	-.20	6.25
FF2	3476	5.64	.05	6.62	728.20	689.31	-.35	6.27
FF1	3379	2.70	.03	6.02	662.20	644.80	-.16	5.86
FB6	2893	-12.08	-.14	6.66	732.60	833.25	.92	7.58
FB5	3060	-6.99	-.08	6.34	697.40	749.85	.48	6.82
FB4	3003	-8.75	-.10	6.51	716.10	784.77	.62	7.13
FB3	3006	-8.64	-.09	6.33	696.30	762.14	.60	6.93
FB2	2970	-9.74	-.11	6.78	745.80	826.32	.73	7.51
FB1	3123	-5.08	-.05	6.19	680.90	717.37	.33	6.52
RD1	3163	-3.86	-.04	6.37	700.70	728.82	.26	6.63
RD2	3202	-2.69	-.03	6.37	700.70	720.10	.18	6.55
RD3	3253	-1.13	-.01	6.50	715.00	723.19	.07	6.57
RD4	3511	6.71	.06	5.82	640.20	599.96	-.37	5.45
RD5	3225	-1.97	-.02	5.99	658.90	672.17	.12	6.11
RD6	3237	-1.62	-.02	6.24	686.40	697.68	.10	6.34
RH1	3520	6.96	.07	5.51	606.10	566.64	-.36	5.15
RH2	3350	1.80	.02	5.74	631.40	620.25	-.10	5.64
RH3	3611	9.75	.09	5.08	558.80	509.17	-.45	4.63
RH4	3683	11.94	.11	4.95	544.50	486.44	-.53	4.42
RH5	3787	15.08	.13	4.82	530.20	460.71	-.63	4.19
RH6	3626	10.21	.09	5.24	576.40	523.00	-.49	4.75
RC1	3543	7.67	.07	5.84	642.40	596.64	-.42	5.42
RC2	3310	.60	.01	5.88	646.80	642.97	-.03	5.85
RC3	3256	-1.06	-.01	5.78	635.80	642.60	.06	5.84
RC4	3203	-2.65	-.03	5.85	643.50	661.03	.16	6.01
RC5	3392	3.09	.03	5.98	657.80	638.07	-.18	5.80
RC6	3447	4.76	.05	5.65	621.50	593.27	-.26	5.39
RG1	3365	2.26	.02	6.41	705.10	689.53	-.14	6.27
RG2	3290	-.02	.00	5.76	633.60	633.75	.00	5.76
RG3	2936	-10.77	-.12	5.58	613.80	687.92	.67	6.25
RG4	3206	-2.55	-.03	5.72	629.20	645.67	.15	5.87
RG5	3243	-1.45	-.01	5.64	620.40	629.55	.08	5.72
RG6	3122	-5.11	-.05	5.72	629.20	663.08	.31	6.03
	2,893		-13.74				3290	
	3,290		13.11				.00	
							.00	

OUTER AIR REGISTER
AFTER FIRST ITERATION!

IP7_000829